

SPECIFICATION AMENDMENTS

Replace the paragraph beginning at page 6, line 18 with:

An Nd-Fe-B isotropic magnet powder having a maximum length of less than 1,000 μm and an average thickness of 30 μm , which is produced by a ~~liquid quenching~~ rapid solidification method, and a ferrite anisotropic magnet powder having an average particle size of 1.4 μm , were subjected to surface coating treatment using isopropyl-triisostearoyl titanate which is a titanate coupling agent. A coating treatment method for a surface of each of the magnet powders includes the following.

Replace the paragraph beginning at page 8, line 5 with:

A weight ratio of the Nd-Fe-B magnet powder, the ferrite magnet powder, and the thermoplastic resin powder ~~at this time~~ was 54.5 wt% to 36 wt% to 9.5 wt%.

Replace the paragraph beginning at page 8, line 13 with:

The plastic magnet precursor is first charged from a hopper 9 in which a fluorine resin coating is formed on a surface thereof through a charging port 21 to a heating cylinder 7. The hopper 9 is provided with a vibration mechanism 22, enabling prevention of a bridge formation inside the hopper 9 by the powder-type plastic magnet precursor ~~at this time~~.

Replace the paragraph beginning at page 8, line 23 with:

A heating zone A and a heating zone B of the heating cylinder 7 are heated to a temperature of 230°C by a heater. The charged plastic magnet precursor is plasticized, receiving heat, and is conveyed to a reservoir zone 10 (heating zone C) in the front portion of the heating cylinder 7 by a screw 8 which rotates through a screw rotating mechanism 12. After reaching a required amount, the plastic magnet precursor inside the reservoir zone 10 heated to 240°C is pressurized through a pressurizing mechanism 13, and is spouted and injected from an injection port 14 at the tip of the heating cylinder 7 into a mold 11. The mold is heated to 50 to 180°C as required to prevent surface roughening of ~~a~~ the surface of ~~a~~ the mold-molded product during injection.

Replace the paragraph beginning at page 9, line 11 with:

The mold 11 is provided with ring-shaped electromagnetic coils 17. An electric current is passed through the electromagnetic coils 17 to produce a magnetic field of 1.5 T, thereby ~~obtaining~~ producing a plastic magnet having a diameter of 30 mm and a thickness of 8 mm and having a magnetic anisotropy in the direction of the film thickness owing to an orientation of magnet powders ~~by~~ in the magnetic field of the coils.

Replace the paragraph beginning at page 10, line 1 with:

As a comparative example, two kinds of the magnet powders coated with the above coupling agent and the thermoplastic resin powder, to which the above antioxidants ~~and the like~~ were added, ~~were subjected to kneading extrusion using a biaxial extruder into strands~~ were kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer. ~~An injection~~ Injection molding was carried out using the pellets to ~~obtain~~ produce a plastic magnet having a diameter of 30 mm and a thickness of 8 mm.

Replace the paragraph beginning at page 11, line 9 with:

Fig. 2A is an explanatory diagram of the plastic magnet precursor according to Example 1 and shows a state in which a thermoplastic resin powder 2 is bonded to magnet powders 1 through a coupling agent 4 ~~coating~~ covering surfaces of the magnet powders 1 having a larger size than the thermoplastic resin powder 2.

Replace the paragraph beginning at page 11, line 14 with:

In addition, as shown in Fig. 2B, the thermoplastic resin powder 2 may be bonded to magnet powders 3 through the coupling agent 4 ~~coating~~ covering surfaces of the magnet powders 3 having a smaller size than the thermoplastic resin powder 2.

Replace the paragraph beginning at page 11, line 18 with:

The plastic magnet precursor according to Example 1 includes the thermoplastic resin powder 2 bonded around two kinds of the magnet powders 1 through the coupling agent 4 ~~to~~

~~form a powder shape.~~ A kneading step is not included in a production process of the plastic magnet precursor, enabling prevention of heat deterioration and oxidation of the thermoplastic resin powder and destruction of the magnet powder ~~in the same step.~~

Replace the paragraph beginning at page 12, line 8 with:

Further, two kinds of the magnet powders 1 are coated with the coupling agent 4 which bonds the magnet powders 1 and the thermoplastic resin powder 2. Therefore, adhesion ~~of~~ between the magnet powders 1 ~~with and~~ and the thermoplastic resin powder 2 is reinforced, thus enabling prevention of ~~fall~~ falling off of the powders after ~~adhering~~ mixing.

Replace the paragraph beginning at page 12, line 18 with:

Further, for the plastic magnet precursor according to Example 1, two kinds of the magnet powders 1 coated with the coupling agent 4 were mixed with the thermoplastic resin powder 2 at a temperature of ~~a~~ the softening point of the coupling agent 4 or above and a melting temperature of the thermoplastic resin powder or below. Therefore, the magnet powders 1 ~~coated with~~ were joined to the coupling agent 4 ~~have by~~ by a hydrolyzable group ~~side~~ of the coupling agent 4 ~~bonded with the magnet powders 1.~~ The magnet powders 1 ~~easily bond with the thermoplastic resin powder 2~~ having was joined to the coupling agent 4 by an organic functional group ~~side~~ of the ~~softened~~ coupling agent 4 ~~outside~~, thereby producing a plastic magnet precursor for injection molding without the kneading step.

Replace the paragraph beginning at page 14, line 12 with:

As a comparative example, a powder obtained by pulverizing molded sprue and runner generated during injection molding of Comparative Example 1 ~~of Example 1~~ and the pellets of Comparative Example 1 ~~of Example 1~~ were mixed and stirred ~~at~~ in a weight ratio of 3 to 7 to obtain a plastic magnet precursor. Injection molding was carried out using the plastic magnet precursor under the same conditions, to ~~obtain~~ produce a plastic magnet having the same shape as that of Example 2.

Replace the paragraph beginning at page 15, line 4 with:

An Nd-Fe-B isotropic magnet powder having a maximum length of less than 1,000 μm and an average thickness of 30 μm , which is produced by ~~a liquid quenching method~~ rapid solidification, was subjected to coating treatment of a surface using a γ -ureidopropyltriethoxysilane which is a silane coupling agent.

Replace the paragraph beginning at page 16, line 20 with:

As a comparative example, the magnet powder coated with the above coupling ~~agents~~ agent and the resin powder, to which the above antioxidants were added, and the above metal deactivation were ~~subjected to kneading extrusion using a biaxial extruder into strands~~ kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer. ~~An injection~~ Injection molding was carried out similarly using the pellets to ~~obtain~~ produce a plastic magnet having the same size as that of Example 3.

Replace the paragraph beginning at page 17, line 12 with:

An Sm-Fe-N anisotropic magnet powder having an average particle size of 3 μm , which is produced through reduction-diffusion process, was heated to 275°C, which is close to a melting point of the thermoplastic resin, in an inert gas atmosphere.

Replace the paragraph beginning at page 18, line 11 with:

As a comparative example, the magnet powder and the thermoplastic resin powder, to which ~~a the above~~ the above metal deactivator was added, were ~~subjected to kneading extrusion using a biaxial extruder into strands~~ kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer. An injection molding was carried out similarly using the pellets to obtain a plastic magnet having the same shape as that of Example 4.

Replace the paragraph beginning at page 19, line 7 with:

The plastic magnet precursor according to Example 4 includes the magnet powder 1 adhered around the thermoplastic resin powder 2. Similar to Examples 1 to 3, a kneading step is not included in the production process of the plastic magnet precursor, enabling prevention of heat deterioration and oxidation of the resin and destruction of the magnet powder ~~in the same step.~~

Replace the paragraph beginning at page 19, line 21 with:

An Nd-Fe-B isotropic magnet powder having an average particle size of 30 μm , which is produced by ~~a liquid quenching method~~ rapid solidification, was heated to 180°C, which is close to a melting point of a polyamide 12 resin, a thermoplastic resin powder, in an inert gas atmosphere.

Replace the paragraph beginning at page 20, line 1 with:

Then, to the heated Nd-Fe-B isotropic magnet powder, 0.2 parts by weight of 2',3-bis[[3-[3,5-di-tert-butyl-4-hydroxyphenyl]propionyl]]propionohydrazide which is a metal deactivator, 0.1 parts by weight of N,N'-hexane-1,6-diylbis[3-(3,5-di-tert-butyl-4-hydroxyphenylpropionamide)] which is a hindered phenol antioxidant, 0.15 parts by weight of tris(2,4-di-tert-butylphenyl)phosphite which is a phosphorus antioxidant, and 0.05 parts by weight of a reaction product of 3-hydroxy-5,7-di-tert-butylfuran-2-one which is a lactone antioxidant and xylene were added. Then, the magnetic powder was added into the polyamide 12 resin powder, and stirred at high speed at room temperature in an inert gas atmosphere, ~~and stirred at high speed~~ to produce a plastic magnet precursor for injection molding.

Replace the paragraph beginning at page 21, line 2 with:

As a comparative example, a mixture of the magnet powder and the thermoplastic resin powder, to which the above antioxidants and ~~a~~ the above metal deactivator were added, ~~was subjected to kneading extrusion using a biaxial extruder into strands~~ were kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer.

Replace the paragraph beginning at page 21, line 23 with:

The plastic magnet precursor according to Example 5 includes the thermoplastic resin powder 2 adhered around the magnet powder 1. Similar to Examples 1 to 4, a kneading step is not included in the production process of the plastic magnet precursor, enabling prevention of heat deterioration and oxidation of the resin and destruction of the magnet powder ~~in the same step.~~

Replace the paragraph beginning at page 22, line 13 with:

To 100 parts by weight of an Sm-Fe-N anisotropic magnet powder having an average particle size of $3\ \mu\text{m}$, which is produced through reduction-diffusion ~~process~~, a solution, in which 0.2 parts by weight of acetoalkoxy aluminum diisopropylate, which is an aluminum coupling agent, was diluted with isopropyl alcohol to a concentration of 2 ml/100 ml, was added to prepare a slurry, and the mixture was mixed and stirred. Then, the mixture was stirred under vacuum at 80°C using a vacuum heat mixing stirrer to remove isopropyl alcohol.

Replace the paragraph beginning at page 22, line 21 with:

Further, ~~an ultraviolet-ray light~~ light with a wavelength of 254 nm was irradiated for 90 seconds to activate the coupling agent ~~coating~~ covering the magnet powder.

Replace the paragraph beginning at page 23, line 20 with:

As a comparative example, the magnet powder coated with the activated coupling agent and the thermoplastic resin powder, to which ~~a~~ the above metal deactivator was added, ~~were subjected to kneading extrusion using a biaxial extruder into strands~~ were kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer.

Replace the paragraph beginning at page 24, line 12 with:

Fig. 5A is an explanatory diagram showing a state of the thermoplastic resin powder 2 bonding ~~with~~ to the magnet powder 1 through the activated coupling agent ~~6-coating~~ covering

the magnet powder 1 having a larger size than the thermoplastic resin powder 2 and may be showing the above thermoplastic resin powder itself.

Replace the paragraph beginning at page 24, line 17 with:

Fig. 5B is an explanatory diagram of the plastic magnet precursor according to Example 6 and shows a state of the magnet powder 3 bonding ~~with~~ to the thermoplastic resin powder 2 through the activated coupling agent 6 ~~coating~~ covering the magnet powder 3 ~~and~~ having a smaller size than the thermoplastic resin powder 2.

Delete the paragraph beginning at page 24, line 22.

Replace the paragraph beginning at page 24, line 24 with:

The plastic magnet precursor according to Example 6 includes the thermoplastic resin powder 2 adhered to the coupling agent 6 coated around the magnet powder 1. Similar to Example 1, a kneading step is not included in the production process of the plastic magnet precursor, enabling prevention of heat deterioration and oxidation of the resin and destruction of the magnet powder ~~in the same step~~.

Replace the paragraph beginning at page 25, line 17 with:

An ultraviolet ~~ray~~ light irradiator 30 as an activation means may be provided in the hopper 9 for activation of the coupling agent ~~coating~~ covering the surface of the magnet powder 1 as shown in Fig. 14.

Replace the paragraph beginning at page 25, line 21 with:

1 part by weight of isopropyl tri(N-aminoethyl-aminoethyl)titanate, which is a titanate coupling agent, with respect to 100 parts by weight of a magnet powder was diluted with methyl alcohol to concentration of 20 ml/100 ml. The solution was sprayed ~~to~~ on an Nd-Fe-B anisotropic magnet powder having an average particle size of 50 μm , which is produced by an HDDR method. Then, the mixture was heated under vacuum at 60°C using a vacuum heat mixing stirrer to remove methyl alcohol, thereby producing a magnet powder having a surface thereof coated with the coupling agent.

Replace the paragraph beginning at page 27, line 3 with:

As a comparative example, the magnet powder coated with the above coupling agent and the activated thermoplastic resin powder, to which the above antioxidants were added, ~~were subjected to kneading extrusion using a biaxial extruder into strands~~ were kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer. ~~An injection~~ Injection molding was carried out similarly using the pellets to ~~obtain~~ produce a plastic magnet having the same size as that of Example 7.

Replace the paragraph beginning at page 27, line 18 with:

Fig. 6A is an explanatory diagram of the plastic magnet precursor according to Example 7 and shows a state of a thermoplastic resin powder 5 bonding ~~with~~ to the magnet powder 1 having a larger size than the thermoplastic resin powder 5, which has an activated surface, through the coupling agent 4.

Replace the paragraph beginning at page 29, line 6 with:

1 part by weight of isopropyl tris(dodecylbenzenesulfonyl)titanate, which is a titanate coupling agent, with respect to 100 parts by weight of a magnet powder was diluted with methyl alcohol to concentration of 20 ml/100 ml. The solution was sprayed to an Sm-Co anisotropic magnet powder having an average particle size of 3 μm and an Sm-Fe-N anisotropic magnet powder having an average particle size of 5 μm , which is produced through a reduction-diffusion process. Then, the mixture was heated under vacuum at 60°C using a vacuum heat mixing stirrer to remove methyl alcohol, thereby producing a magnet powder coated with the coupling agent.

Replace the paragraph beginning at page 30, line 14 with:

As a comparative example, two kinds of the magnet powders coated with the above coupling agent and the activated thermoplastic resin powder, to which the above antioxidants were added, ~~were subjected to kneading extrusion using a biaxial extruder into strands~~ were kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet

precursor were produced using a pelletizer. ~~An injection~~ Injection molding was carried out similarly, using the pellets to ~~obtain~~ produce a plastic magnet having the same size as that of Example 8.

Replace the paragraph beginning at page 31, line 11 with:

Into a wholly aromatic polyester powder stirred at high speed, which is a thermoplastic resin powder, having a surface activated by a corona discharge treatment in which electrons generated by an applied voltage of 15 kV collide with the surface, 0.2 parts by weight of 3,3',3'',5,5',5''-hexa-tert-butyl-a,a',a''-(mesitylene-2,4,6-triyl)tri-p-cresol was added with respect to 100 parts by weight of the resin. Then, an Sm-Fe-N anisotropic magnet powder having an average particle size of 5 μm , which is produced through a reduction-diffusion process, and an Nd-Fe-B isotropic magnet powder having an average particle size of 30 μm , which is produced by a liquid quenching method, both heated to 200°C, were added in an inert gas atmosphere. Then, the mixture was stirred at high speed for 10 minutes to produce a plastic magnet precursor for injection molding.

Replace the paragraph beginning at page 32, line 13 with:

As a comparative example, two kinds of the magnet powders and the activated thermoplastic resin powder, to which the above antioxidants were added, ~~were subjected to kneading extrusion using a biaxial extruder into strands~~ were kneaded and extruded into strands using a biaxial extruder, and pellets of the plastic magnet precursor were produced using a pelletizer. ~~An injection~~ Injection molding was carried out similarly using the pellets to ~~obtain~~ produce a plastic magnet having the same size as that of Example 9.

Replace the paragraph beginning at page 34, line 3 with:

The coupling agent is not limited to the coupling agents used in each of Examples. In addition, examples thereof may include: titanate coupling agents such as isopropyltris(diocetylpyrophosphate) titanate, bis(diocetylpyrophosphate)oxyacetate titanate, isopropyltricumylphenyltitanate, dicumylphenyloxyacetate titanate; and silane coupling agents such as N- β -(aminoethyl)- γ -aminopropyl-trimethoxysilane, γ -aminopropyl-triethoxysilane, γ -mercaptopropyl-trimethoxysilane, and β -(3,4-epoxycyclohexyl)ethyl-trimethoxysilane.